

ATTACHMENT A



Mudford Farm in the Chesapeake Bay:
Financing production, biodiversity, and ecosystem services
through innovative land restoration

Farms of the Future Project

Office of Environmental Markets, USDA
EcoAgriculture Partners

DRAFT 7.2.2010

Ariela Summit, EcoAgriculture Partners (asummit@ecoagriculture.org)
Richard Pritzlaff, Biophilia Foundation (biophilia@verizon.net)
Chris Pupke, Chesapeake Wildlife Heritage (cpupke@cheswildlife.org)
Ned Gerber, Chesapeake Wildlife Heritage (nedgerber@verizon.net)

Introduction

Mudford Farm provides an example of how innovative financing mechanisms can be used to jumpstart pre-compliance markets for environmental services in the Chesapeake Bay while retaining working agricultural land. The Biophilia Foundation, a non-profit organization, bought the Mudford Farm property in 2005 and with the help of conservation program through the Farm Bill and Maryland Department of the Environment, restored wetlands and created buffers and upland habitat on degraded land. A local partner and non-profit, Chesapeake Wildlife Heritage, designed and implemented the restoration plans. Another non-profit, Water Stewardship Inc., measured the reduction in nutrient runoff from the property, and translated this information to nutrient reduction credits that would be available for sale to investors. The Biophilia Foundation and partners anticipate that these credits will appreciate in value as a legislative framework for nutrient trading is established in the Chesapeake Bay. In the meantime, they plan to re-sell the Mudford property to a buyer who may be interested in the conservation value of the land, as well as its continued capacity for production.

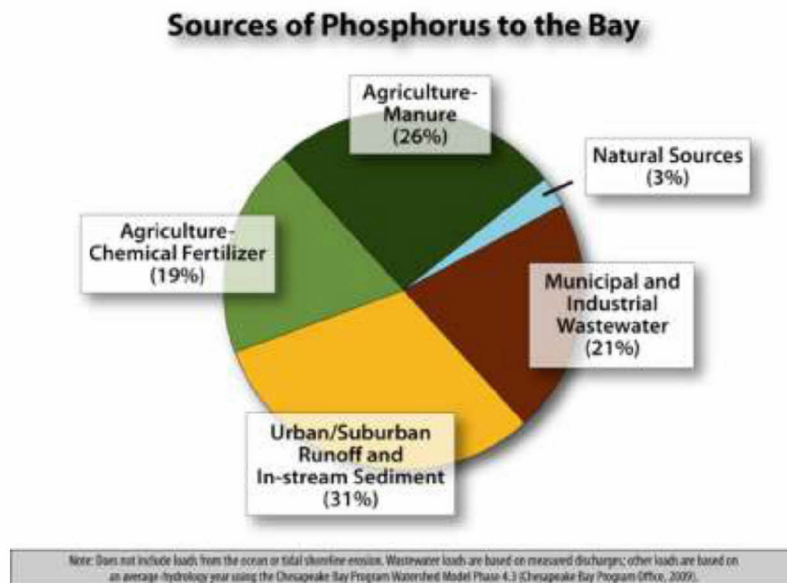
Agricultural, Ecological and Regulatory Context

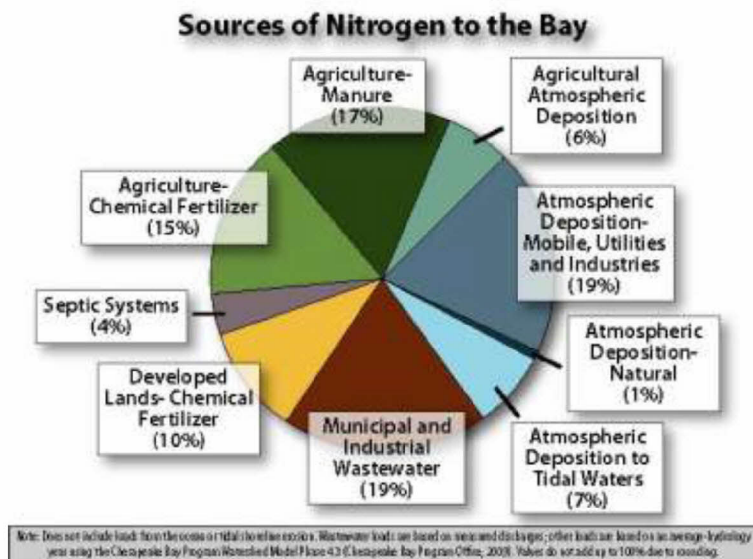
Agriculture presents a critical opportunity for restoring water quality and biodiversity through market based mechanisms for environmental services in the Chesapeake Bay region. The Bay is the largest estuary in the United States, with tributaries draining from the 64,000 square-mile watershed, and over 11,684 miles of shoreline. It is home to nearly 17 million people, and supports over than 3600 species of plants, fish and other animals (Chesapeake Bay Compliance and Enforcement Strategy 2010). Including part of six states - Delaware, Maryland, New York, Pennsylvania, Virginia and West Virginia, and the entire District of Columbia – the Bay has received a huge amount of national attention over the past 30 years. Since the signing of the inter-state Chesapeake Bay Agreement of 1983, however, water quality has continued to decline, with a negative impact on fisheries and local water-based livelihoods.

Excess nutrients from non-point sources are the primary culprit for poor water quality in the Bay, with nitrogen and phosphorus runoff causing algal blooms and associated

eutrophication. Nitrogen and phosphorus pollution enter the Bay through fertilizers applications on agricultural land, wastewater treatment plants, urban and suburban runoff, and air pollution (Figure 2). The Federal Clean Water Act regulates only the total maximum daily loads for pollution from point sources, which has forced the Environmental Protection Agency and partners such as the Chesapeake Bay Foundation to be creative in their approach to reducing non-point source pollution. While these efforts have resulted in a 6 percent improvement in health since 2008, the Chesapeake Bay Program still rates the overall health of the Bay at a weak 45 percent on a score card averaged from measures of water quality, habitats and the lower food web, and fish and shellfish (Bay Barometer 2009). Most recently, President Obama signed an Executive Order in May of 2009 calling on the federal government to lead pollution control efforts and protect wildlife habitats in the region.

Figure 1: Relative Responsibility for Pollution Loads to the Chesapeake Bay





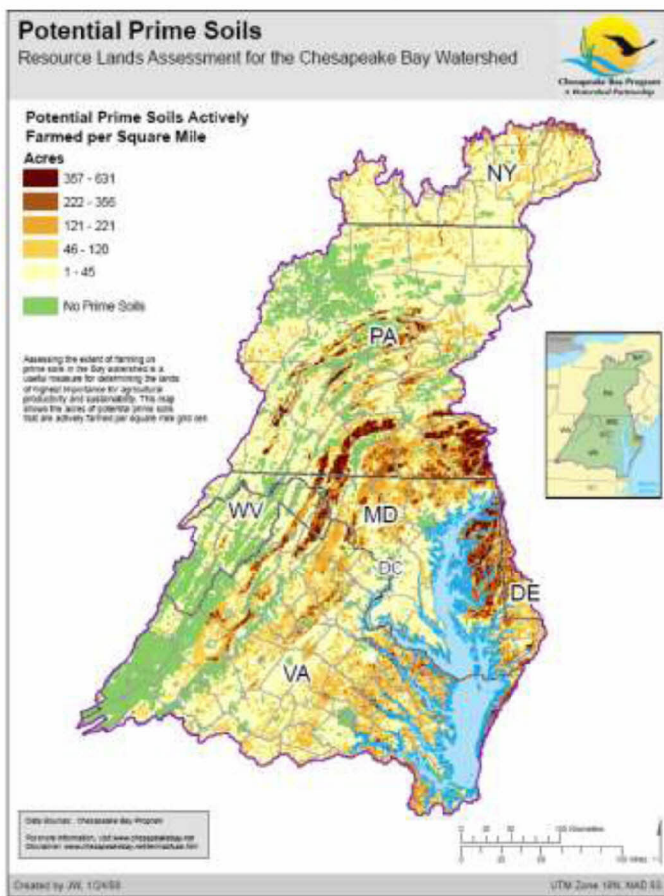
Source: *The Chesapeake Bay Program, 2009*

Agriculture, which occupies 25 percent of the land in the Chesapeake Bay watershed, provides both an avenue to reduce nutrient pollution, and to cultivate the ecosystem services upon which the region depends. The 9 million acres of land in crop, livestock, and poultry production represent an important opportunity to provide ecosystem services by filtering groundwater runoff, sequestering carbon, and providing habitat for waterfowl, small mammals, and insect populations. The Chesapeake Bay Program maintains that best management practices in agriculture such as stream buffers, restored wetlands, cover crops, and rotational grazing are the most cost-effective way to reduce nitrogen and phosphorus pollution to the Bay. In fact, scientists estimate that best management practices could reduce two-thirds of the nitrogen and phosphorus reductions necessary to restore the Chesapeake Bay, at only 13 percent of the total cost of Bay restoration (Vital Signs 2005).

Agricultural land is under severe pressure from suburban sprawl, however, with more than 90,000 acres - almost 150 square miles - lost each year in the Bay states. The

number of farms has also continued to decrease by 75 percent in the last 50 years, from approximately 350,000 to about 100,000 (Vital Signs 2005). Successful strategies for environmental conservation in the Chesapeake Bay must target farmers as stewards of soil health, water quality, and biodiversity, and work with them to craft economically viable means of continuing production and sustainable resource management.

Figure 2: Prime Farmland in the Chesapeake Bay Watershed



Source: Chesapeake Bay Program, 2008

Environmental markets which leverage private funds to compensate farmers for reduced nitrogen and phosphorus usage, as well as a broader suite of credits such as carbon sequestration and biodiversity conservation, provide an opportunity to change farmer behavior within a market framework. Motivated by the success of EPA's air pollution credit auctions in the 1980s, an increasing array of environmental 'commodities' are beginning to be defined, certified, monitored and exchanged in the Bay region. Some of the front runners in environmental market development in the Bay include the Bay Bank (<http://www.thebaybank.org/>), the Chesapeake Fund (<http://www.chesapeakefund.org>), and state nutrient trading operations.

3. Mudford Farm Profile

Comment [P1]: Tag photo: Crops on Mudford Farm, Spring 2010, taken by Wenceslao Almazan

This case study focuses on one of the pilot efforts to create markets for nutrient trading in the Chesapeake Bay. In Annapolis, MD, the Biophilia Foundation is working with local partners to utilize farm bill programs to restore degraded agricultural land and market nutrient reduction credits while keeping the most productive soils in



farming. A unique aspect of Biophilia's approach is that they operate using a land development and resale model, where they buy farm properties, restore them for conservation and continued production, and then resell them to a buyer with permanent restrictions on land use. The Biophilia Foundation is a non-profit organization headed by Richard Pritzlaff, whose funding base comes from both private and grant-based sources. On Mudford Farm, Richard and staff worked closely with two non-profit partners: Chesapeake Wildlife Heritage, who performed the site evaluation and Water Stewardship Inc. who developed and implemented a scientific standard for tracking nutrient reduction credits.

Figure 3: Farms Restored and Protected by the Biophilia Foundation/Chesapeake Wildlife Heritage



Source: The Biophilia Foundation, 2010

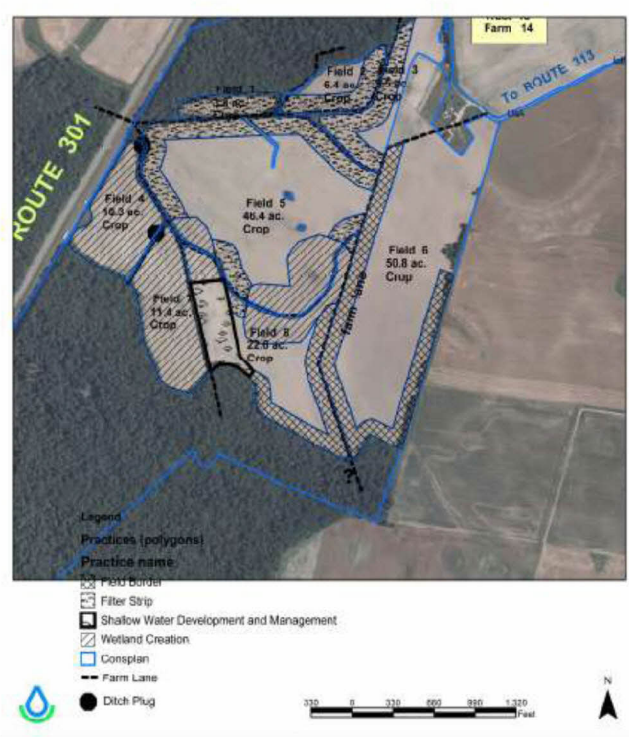
Using their model of land purchase, restoration for ecosystem services, and resale, the Biophilia Foundation and Chesapeake Wildlife Heritage have restored and protected six farms within Maryland's mid-Eastern Shore within the past eight years. In total, these properties comprise 1415 acres, of which portions have been converted to grassland buffers, forested buffers, tidal wetlands and mature woodlands, all of which provide a habitat for wildlife and filter for agricultural runoff. A total of 369 acres of the most productive farmland have stayed in agricultural crops, with nutrients from fertilizer applications filtered by the wetlands and grassland buffers resulting in less nutrient runoff to the Chesapeake Bay.

Table 1: Total Impact, Biophilia Foundation/Chesapeake Wildlife Heritage Eastern Shore Properties

Farm	Total Acres	Restored Wetlands	Warm Season Grass Buffers	Forested Buffers	BMP Farmland	% Reduction Nitrogen	% Reduction Phosphorus
Spencer	190	35	6	3	40	76.6%	75.9%
Riverbend	236	57	11	30	95	76.1%	75.4%
Chic	393	24	10	14	85	60.5%	59.3%
Mudford	274	38.8	43.6	-	80	75.9%	75.2%
Rash	151	17.7	32	-	69	80.2%	79.6%
Anchovie Hills	171	68.0	38	69	0	98.0%	95.7%
Totals	1415	240.5	140.6	116	369	75.3%	74.3%

The Mudford Farm property is located one mile north of Sudlersville and eight miles northeast of Centerville in Queen Anne’s County, Maryland. It lies at the headwaters of the Chester River which runs approximately 40 miles from its origin in Delaware to the Chesapeake Bay. Mudford farm was purchased by the Biophilia Foundation in 2005, and was previously owned by an absentee landlord who contracted out farm management and labor, as is common in the region. The property consists of approximately 275 acres, of which 162 acres were in row crops at the time of purchase and 113 acres were in mature forest. Row crops included wheat, corn, and soybeans. During 2007-2008, the Biophilia Foundation worked with a Chesapeake Wildlife Heritage to design, build, and manage wetlands and warm season grass buffers on the farm utilizing landowner incentives offered through the U.S. Department of Agriculture’s Conservation Reserve Program (CRP) and Conservation Reserve Enhancement Program (CREP), and the Maryland Department of the Environment (see Annex 1). The most productive land continued to be farmed in a wheat, corn, and soybean rotation using low impact fertilizer and pest control techniques.

Figure 4. Mudford Management Plan under the Biophilia Foundation



Source: Biophilia Foundation 2010

Conservation management strategy

The Biophilia Foundation contracted Chesapeake Wildlife Heritage, a local nonprofit focusing on restoration and land management on the Eastern Shore, to provide an initial environmental assessment of the Mudford Farm property. This assessment revealed significant areas of poorly drained, anaerobic soils on cropped land. Based on this criterion, the Biophilia Foundation submitted applications to CRP and CREP, eventually establishing four different classifications of conservation measures on the land including filter strip, riparian buffers, wetland restoration, and field borders on the property (figure

4). Altogether, these federal programs helped restore 38.8 acres of wetland, and create 43.6 acres to warm season grass meadows on Mudford farm.

Strategically placed buffers and wetlands filter nutrients used on crop fields, and provided a habitat for waterfowl, quail, wild turkey, and other animal species. Michael Robin Haggie of Chesapeake Wildlife Heritage has been collecting four to five years of raw field data (2005-2010 tracking bird sightings at Mudford farm, and verifies that all puddle ducks and shorebirds are there due to restoration efforts. He is also working on a peer reviewed publication focusing on effects of native versus non-native warm season and cold season grass studies on wildlife within the CREP program. The additional waterfowl increase the value of hunting leases on the land and the landowner (currently the Biophilia Foundation) is paid a yearly rental payment through CREP of about \$12,000, for a period of 15 years.

As well as utilizing federal conservation programs, the Biophilia Foundation took advantages of wetland banking opportunities through the state of Maryland. Last year, they sold a ten acre wetland bank established through CREP to the state of Maryland at \$8000 an acre, for a total of \$80,000. The wetland is protected in permanent easement through an agreement between the Biophilia Foundation (grantor) and Chesapeake Wildlife Heritage (grantee) - see Annex 2. The remainder of the farm is not yet under easement, though the Biophilia Foundation and Chesapeake Wildlife Heritage hope to close on a CREP easement in the fall of 2010 (email correspondence, Chris Pupke, June 1, 2010).



Restored wetland, Mudford farm, taken by Wenceslao Almazan 2010

While this type of doubling up on federal and state programs for wetland restoration and protection was legal at the time of the transaction, it is now prohibited for landowners to profit from two conservation programs on the same piece of land. The Biophilia Foundation and Chesapeake Wildlife Heritage see this as a setback to transitioning to healthier land uses in the Bay, by mandating an either/or approach toward programs which are naturally complimentary in nature. In this case, CREP facilitated the transition of degraded cropland to wetland by providing transition cost-share and rental payments on the land for 15 years. The easement that created the wetland bank provided the opportunity to keep the land in permanent easement, and for the landowners to earn additional income, in the form of a lump payment for development rights. An emerging market for nutrient reduction credits in conjunction with federal and state land retirement programs could provide an additional financial incentive for farmers to add the “farming of environmental services” to their product portfolio.

Table 2: Main Actors in Relation to the redevelopment of Mudford Farm

Actor	Role
The Biophilia Foundation http://www.biophiliafoundation.org/	Non-profit working to advance biodiversity conservation on private lands
Chesapeake Wildlife Heritage http://www.cheswildlife.org/chesapeakecare.html	Non-profit which designs, builds, and manages habitat to increase native biodiversity and links landowners to Farm Bill conservation programs
Water Stewardship Inc. http://corporatewaterstewardship.org/	Non-profit which evaluated the nitrogen and phosphorus reduction credits that could be available for sale as a result of implementation of conservation measures on the farm.
Mission Markets www.missionmarkets.com	Private investment exchange facilitating transactions within the social and environmental capital markets.
Markit http://www.markit.com/en/?	A global online registry of carbon, water and other biodiversity credits available for sale including indicative quantities and price
Chesapeake Ecofinance Company http://site.chesapeake-Ecofinance.com/About.html	Limited liability company formed in 2010 to handle the financial transactions formerly associated with the Biophilia Foundation

The Biophilia Foundation and Chesapeake Ecofinance foresee future opportunities for protecting the ecosystem service value of Mudford Farm in perpetuity, aside from the 10 acres that are already protected in permanent easement through Maryland Department of the Environment. They are hoping to put another 160 acres in permanent easement through the sale of a CREP easement to Maryland Department of Natural Resources .

Comment [P2]: Correct wording here?

The Biophilia Foundation and partners are also hoping to sell an agricultural land easement on the 80 acres of productive cropland through the Maryland Agricultural Land Preservation Foundation next year. Conservation easements contain detailed provisions to provide for adaptive management of restored habitat areas, and will be updated every fifteen years by ecologists from Chesapeake Wildlife Heritage (see sample easement in Annex). An agricultural easement would cover the 80 most productive acres that are currently being farmed in a corn, wheat, and soy rotation using farming techniques that reduce nutrient runoff, including crop rotations, precision nutrient management, and no insecticides. Depending on the terms that are negotiated, Chesapeake Wildlife Heritage would work with the farmer on a mandatory or voluntary basis to continue a similar land management regime.

Ideally, Richard Pritzlaff and the Biophilia team would like to sell Mudford Farm to a “conservation buyer” – either an individual, or group of young farmers who value the conservation measures that have been put onto place on the land, and want to diversify agricultural production to support a regional food economy. They anticipate breaking even on the property, which they would consider selling at below market cost to the right type of buyer. Revenue from the sale of nutrient reduction credits would allow them to make the land more affordable. That said, however, Richard Pace who is the Chief Operating Officer of Chesapeake Ecofinance Company, has serious reservations that the Eastern Shore could support a market for local produce. On the other 4 properties that the Biophilia Foundation bought and resold on the Eastern Shore the “conservation buyer” generally fit the profile of a gentleman farmer, who was interested in the land primarily for conservation and quality of life values, and not aiming to run it as a profitable operation (the Biophilia Foundation and Chesapeake Wildlife Heritage consulted on the two remaining Eastern Shore properties). By making the farming option financially viable through participation in Farm Bill programs and environmental service markets, however, the Biophilia Foundation and Chesapeake Wildlife Heritage hope to surmount cultural barriers on the Eastern Shore that discourage non-traditional modes of farming.

Nutrient reduction credits

Rather than waiting for a fully formed nutrient trading market to emerge in the Bay area, the Biophilia Foundation pursued a pro-active strategy by contracting Water Stewardship Inc. to evaluate the nitrogen (N) and phosphorus (P) reduction credits that could be available for sale as a result of implementation of conservation measures on the farm (Annex 3). Water Stewardship Inc. is a non-profit based in Annapolis, MD and headed by Tom Simpson. As part of the credit evaluation process, the Biophilia Foundation provided them with maps of the parcel showing location and approximate acreage of the practices implemented and the remaining cropland. This information was subsequently updated with the farm’s nutrient management plan and the US Department of Agriculture and Natural Resource Conservation Service (NRCS) map showing location and acreage of the implemented practices. Water Stewardship Inc. evaluated the information provided

and then conducted a detailed site evaluation including soil borings and intermittent measurement of buffer width to verify or modify the information on the Biophilia Foundation and NRCS maps.

Based on an evaluation of information provided by the Biophilia Foundation, the site evaluation and the suite of practices implemented on the farm, Water Stewardship Inc. used standard procedures, nutrient loads and best management practice efficiencies and application protocols adapted from the Chesapeake Bay Program and the Water Stewardship Inc. Nutrient Load Estimator software to determine the nitrogen and phosphorus reductions that could be verified for use in the voluntary ecosystem market. Cost estimates for these credits were based on best currently available information but may not represent actual market value (table 3). In this study, a nitrogen credit is equal to one pound of nitrogen reduction per year. While a 50 year valuation was used in the Chesapeake Ecofinance Company's original estimates, a more typical assumed design life and value returns for the practices are 15 to 30 years.

Table 3: Summary of Pre and Post BMP Annual Delivered Load to Tidal Waters

Nitrogen

Landuse	Pre-BMP	Post-BMP			
	TN	TN		TN	Total
	Delivered	Delivered	TN	Credit	Annual TN
	Load	Load	Reduction	Value	Credit
	(lbs/yr)	(lbs/yr)	(lbs/yr)	(\$/lb/yr)	Value
Conservation Tillage Cropland	3052.9	734.2	-	-	-
Warm Season Grass Buffers	0.0	225.8	-	-	-
Warm Season Grass Wildlife					
Habitat	0.0	235.9	-	-	-
Wetlands	0.0	51.8	-	-	-
TOTAL	3052.9	1247.8	1805.1	\$10	\$18,051.07

Phosphorus

Landuse	Post-BMP				
	Pre-BMP	TP	TP	TP Credit	Total
	TP Delivered	Delivered	Reductio	Value	Annual TP
	Load (lbs/yr)	Load (lbs/yr)	n (lbs/yr)	(\$/lb/yr)	Credit Value
Conservation Tillage Cropland	143.9	39.0	-	-	-
Warm Season Grass Buffers	0.0	2.4	-	-	-
Warm Season Grass Wildlife Habitat	0.0	2.5	-	-	-
Wetlands	0.0	1.9	-	-	-
TOTAL	143.9	45.7	98.3	\$5	\$491.38

The credits generated from this evaluation are registered with the firm Markit and being offered for sale through the Bay Bank and Mission Markets. Revenue from credits will accrue to the Chesapeake Ecofinance Company, and be reinvested in the property to pay for the permanent stewardship of conservation practices through an easement requiring management by a land trust. Any additional income from the credits will be reinvested in similar enterprises. In pursuing nutrient reduction accreditation at Mudford Farm, the Biophilia Foundation anticipated that financial investors would be the primary buyer in a private ecosystem service market. The Biophilia Foundation anticipates that the scientific standard use by Water Stewardship Inc. in evaluating nutrient reduction credits will provide an important precedent for eventual standards established by the USDA and EPA. Ecosystem service credits, which are now purchased entirely on a voluntary basis, would increase significantly in value if a mandatory non-point source regulatory framework was put into place in the Chesapeake Bay. As a more robust environmental market framework is established in the Bay region, owners of Chesapeake Ecofinance credits would be poised to take advantage of the opportunities such a marketplace presents.

Scaling Up: Challenges and Opportunities

As a non-profit with a stable funding base drawn from grants and private donations, the Biophilia Foundation was able to finance the up-front costs (eventually reimbursed through CREP) for implementing conservation measures, and independently verifying nutrient reduction credits. Based on partnerships they had cultivated within the community, they drew from a significant pool of financial, conservation, and legal expertise. The time, money, and thought that went into the redevelopment plan at Mudford Farm are beyond the reach of most farmers. Nonetheless, the experience provides an important template for envisioning successful strategies for mainstreaming nutrient reduction credits and related markets in the Chesapeake Bay.

The land redevelopment and credit accreditation process used at Mudford could be replicated on other properties - and indeed, the Biophilia Foundation currently has other similar project in the works. It is important to note, though, that the financial success of projects like Mudford depend on a number of factors, and is not a "one size fits all" type of scenario. These variables include the quality of the soils, the irrigation potential of the farm, the proximity to markets, the proximity to populations of migratory birds, how much hunting pressure a site can take, and who farms and owns the land.

Realizing the financial, technical, and socio-cultural barriers to replicating a Mudford-type scenario on a larger scale precipitated the creation of the Chesapeake Ecofinance Company in 2010. Drawing from their experience on Mudford Farm and the other properties on which they have worked, the Biophilia Foundation and partners created the Chesapeake Ecofinance Company, LLC in February of 2010. As a limited liability entity¹, the Chesapeake Ecofinance Company plans to operate a revolving fund of \$20 million to purchase, restore, and resell farm properties in the Eastern Shore area of the Chesapeake Bay, utilizing emerging nutrient credit markets. Initially funded with a substantial bank line-of-credit guaranteed by one of the Company's owners, the

¹ A **limited liability company (LLC)**, is a flexible form of business enterprise that blends elements of partnership and corporate structures. The primary characteristic an LLC shares with a corporation is limited liability, and the primary characteristic it shares with a partnership is the availability of pass through income taxation.

Chesapeake Ecofinance Company is currently seeking further investments through private donors and investors interested in the social mission of the organization. Ultimately, the Chesapeake Ecofinance Company and partners realize that they need to involve more farmers in environmental service markets to improve water quality in the Bay and reinvest in rural economies. By lending farmers start-up funds to implement best managements practices that provide nutrient reduction credit-worthy practices, the Chesapeake Ecofinance Company hopes to reduce the substantial barrier to entry for farmers in entering environmental services markets.

The Chesapeake Ecofinance Company and partners including the Biophilia Foundation, Chesapeake Wildlife Heritage, and Water Stewardship Inc. are currently working on the creation of an ecosystem services farm business network that would use Mudford Farm and another recently acquired property, Talisman Farm, as demonstration sites. The farm business network would train a small group of core farmers on best management practice implementation and continuous improvement programs, subsidies and funding available to implement practices, and the process for registration/certification of credits, including an analysis of potential income. The project team of 3 to 5 core farmers, who have already been identified, anticipate engaging and creating management plans/continuous improvement programs/new revenue stream potential for 25 farmers over the thirty months, as outlined in a conservation innovation grant recently submitted to the USDA (Annex 4).

The goal of this effort is to identify practices or management changes that will result in at least a 50% additional reduction in nitrogen, phosphorus, and sediment runoff if they were to be implemented. The project team is concentrating on initially using a nutrient reduction voluntary credit standard which they believe allows for robust sustainability criteria, based on the prototype created by Water Stewardship Inc. More readily available initial credit-creation funding will be provided by the revolving fund through Chesapeake Ecofinance Company, with the initial goal being to maximize reliable and low risk eco-benefits that will enhance the farming bottom line, that are reasonable to implement, maintain, and monitor.

Payments for environmental services present an important opportunity build on existing conservation programs through the Farm Bill, as demonstrated by the pilot example on Mudford Farm. Specific recommendations of affiliated partners include working with state and federal actors to provide a single easement template for Farm Bill programs, and exploring bundling environmental services on agricultural land. The sale of nutrient reduction credits on formerly polluting agricultural land could provide an important avenue to creatively taking advantage of Farm Bill conservation programs, generating profits for farmers, and pioneering a sustainable land use model in the Bay.

To scale up a model similar to Mudford, we need to mobilize a broad range of sectors from government and the private sector. Comprehensive policy reform is needed to create a framework for nutrient trading in the Chesapeake. Farmers need financially viable and agriculturally rewarding alternatives to intensive crop and poultry farming. Landowners need technical advice and financial incentives to change the current land management regimen. Private capital seeking an investment return must be harnessed to help facilitate needed changes. New tools - such as the valuing of environmental services (water quality/nutrient trading, Eastern Shore species, wildlife habitat, carbon credits) must be integrated and utilized to reach the goal of a restored Chesapeake Bay

Works Cited

US Environmental Protection Agency. May 2010. *Chesapeake Bay Compliance and Enforcement Strategy*. EPA Office of Enforcement and Compliance Assurance, Washington DC.

Vital Signs: Assessing the State of Chesapeake Agriculture in 2005. Chesapeake Bay Foundation, Annapolis MD.

Biophilia Foundation. 2010. *Saving the Bay by Improving - and Funding - Rural Economic Development for Maryland's Eastern Shore Farms and Farmer*. USDA NRCS Conservation Innovation Grant Proposal / Chesapeake Bay Watershed Category / Program Outreach.

Chesapeake Bay Program. 2009. *Bay Barometer. A Health and Restoration Assessment of the Chesapeake Bay in 2009*. Chesapeake Bay Foundation, Annapolis MD.
(http://www.chesapeakebay.net/content/publications/cbp_50513.pdf accessed 8/11/2010)

Sokolow, Alvin D. 2006. *A National View of Agricultural Easement Programs: Measuring Success in Protecting Farmland - Report 4*. American Farmland Trust and University of California Agricultural Issues Center.

Glossary:

Best Management Practices (BMPs): BMPs were developed and implemented as a requirement of the 1977 amendments to the Clean Water Act. BMPs are established soil conservation practices that also provide water quality benefits. They include such practices as cover crops, green manure crops, and stripcropping to control erosion; and soil testing and targeting and timing of chemical applications (similar to IPM) to prevent the loss of nutrients and pesticides.

Chesapeake Bay Program (CBP): The Chesapeake Bay Program is a unique regional partnership that has led and directed the restoration of the Chesapeake Bay since 1983. The Chesapeake Bay Program partners include the states of Maryland, Pennsylvania and Virginia; the District of Columbia; the Chesapeake Bay Commission, a tri-state legislative body; the Environmental Protection Agency, representing the federal government; and participating citizen advisory groups.

Conservation Easement: A conservation easement is a restriction placed on a piece of property to protect its associated resources. The easement is either voluntarily donated or sold by the landowner and constitutes a legally binding agreement that limits certain types of uses or prevents development from taking place on the land in perpetuity while the land remains in private hands.

In a conservation easement, a landowner voluntarily agrees to sell or donate certain rights associated with his or her property – often the right to subdivide or develop – and a private organization or public agency agrees to hold the right to enforce the landowner's promise not to exercise those rights. In essence, the rights are forfeited and no longer exist.

Conservation Reserve Enhancement Program (CREP): In Maryland, the Conservation Reserve Enhancement Program (CREP) offers additional incentives to encourage landowners to implement practices that will help reduce sediment and nutrients in the Chesapeake Bay and will improve wildlife habitat. CREP is seeking to enroll 16,000 acres of highly erodible cropland into grass, shrubs, and/or tree plantings, establish 77,000 acres of riparian buffer habitat, provide 5,000 acres of water and wetland habitat, and restore 2,000 acres of habitat for declining species. CREP is administered by the Farm Service Agency (FSA). NRCS and cooperating agencies are providing technical assistance to help landowners plan and implement CREP practices.

Conservation Reserve Program (CRP): The Conservation Reserve Program (CRP) provides technical and financial assistance to eligible landowners to address soil, water, and related natural resource concerns on their lands in an environmentally beneficial and cost-effective manner. CRP encourages landowners to convert highly erodible cropland and other environmentally sensitive areas to permanent cover, such as introduced or native grasses, trees, filter strips, riparian forest buffers, wetlands, and shallow water habitats.

CRP is funded through the Commodity Credit Corporation (CCC). CCC makes annual rental payments based on the agriculture rental value of the land, and provides cost-share assistance for up to 50 percent of the participant's eligible costs to establish approved conservation practices. Participants enroll in CRP contracts for 10 to 15 years. The program is administered by the Farm Service Agency (FSA), with technical assistance provided by NRCS and other cooperating agencies.

Eutrophication: The process by which a body of water acquires a high concentration of nutrients, especially phosphates and nitrates. These typically promote excessive growth of algae. As the algae die and decompose, high levels of organic matter and the decomposing organisms deplete the water of available oxygen, causing the death of other organisms, such as fish. Eutrophication is a natural, slow-aging process for a water body, but human activity greatly speeds up the process.” -

Chesapeake Bay Executive Order, May 2009: On May 12, 2009, President Barack Obama signed an Executive Order that recognizes the Chesapeake Bay as a national treasure and calls on the federal government to lead a renewed effort to restore and protect the nation's largest estuary and its watershed.

The Chesapeake Bay Protection and Restoration Executive Order established a Federal Leadership Committee that will oversee the development and coordination of reporting, data management and other activities by agencies involved in Bay restoration. The committee will be chaired by the Administrator of the Environmental Protection Agency and include senior representatives from the departments of Agriculture, Commerce, Defense, Homeland Security, Interior, Transportation and others. For more information see: <http://executiveorder.chesapeakebay.net/page/About-the-Executive-Order.aspx>.

Federal Clean Water Act: The Clean Water Act is the primary federal law in the United States governing water pollution. Commonly abbreviated as the CWA, the act established the goals of eliminating releases to water of high amounts of toxic substances, eliminating additional water pollution by 1985, and ensuring that surface waters would meet standards necessary for human sports and recreation by 1983.

The principal body of law currently in effect is based on the Federal Water Pollution Control Amendments of 1972, which significantly expanded and strengthened earlier legislation.^[2] Major amendments were enacted in the Clean Water Act of 1977 and the Water Quality Act of 1987.

Annexes

1. NRCS CREP/CREP Plan for Mudford Farm
2. Conservation Easement on Mudford Farm
3. Water Stewardship Inc. Credit Report
4. Conservation Innovation Grant